

REMARKS

By the present Amendment, various clarifying revisions have been made throughout the specification to address typographical and grammatical occurrences. In addition, the specification at page 8, line 20 has been amended to recite the appropriate pressure. In this regard, applicants are attaching certain technical literature, such as pages 99-102 of the Japanese publication "Fluororesin Handbook" and a partial translation thereof, which indicates that resins containing a filler suitable are subjected to a pressure of 300-1000 kg/cm². Thus, applicants respectfully submit that all the revisions in the specification are in order.

Turning to the claims, claim 1 has been amended to define certain aspects of the present invention with greater precision. In particular, claim 1 has been amended to recite that the tetrafluoroethylene polymer is selected from the group consisting of a homopolymer of tetrafluoroethylene and a copolymer obtained by copolymerizing tetrafluoroethylene with copolymerizable monomers in an amount of not more than 1.0% by weight consistent with the description provided in the first paragraph on page 3 of the specification. The significance of this amended portion of claim 1 is that the defined homopolymer and copolymer have a high melting point and do not have melt processability under normal melt processing conditions as also set forth on page 3. Claim 1 has also been amended to recite the ratios of each of the components based on the description provided in the paragraph beginning at page 6, line 5 of the specification. In view of these recitations, claims 2 and 3 have been cancelled without prejudice or disclaimer. Finally, claim 6 has been amended so that the wording of the claim is consistent with that set forth in claim 1.

The fluororesin composition of the present invention can provide moldings that maintain lubricity and heat-resistant property and can further exhibit superior friction and wearing resistance and compression creep resistance. This makes the resin composition particularly suitable for the molding of sliding parts.

To appreciate the advantages which can be obtained in accordance with the present invention, the Examiner's attention is respectfully directed to the results provided in Table 1 on page 10 of the specification. As may be seen therefrom, illustrative Examples 1-5 provide low sliding temperature, low coefficient of friction, low wearing coefficient and low compression creeping values. In contrast, when either the zinc oxide whisker or filler is absent, one or more of these advantageous characteristics is adversely affected. For instance, when comparing the results of illustrative Examples 1 and 2 with the Comparative Examples 1, 2, 3 and 4, it will be recognized that if both the zinc oxide whisker and carbon fiber are omitted, the wearing coefficient is substantially affected (see Comparative Example 1). When the filler (carbon fiber) is absent as in Comparative Examples 2 and 3, the sliding temperature and compression creeping test results are adversely affected and when the zinc oxide whisker is

absent as in Comparative Example 4, the wearing coefficient, friction coefficient, sliding temperature and compression creeping test results are all substantially affected. Analogous results can be observed by comparing illustrative Example 3 with Comparative Example 5, illustrative Example 4 with Comparative Example 6 and illustrative Example 5 with Comparative Example 7.

With a complete understanding of the present invention and in view of the claims now of record, applicants respectfully submit that the presently claimed invention cannot be rejected over the prior art identified in the Official Action. In particular, Oku, U.S. Patent No. 5,276,080, describes a static dissipative resin composition comprising a resin, zinc oxide whisker and conductive filler.

The resins which are used in the composition are set forth with greater particularity in the passage beginning at column 9, line 41 with specific resins being described in the passage beginning at column 9, line 55. None of the described resins set forth in this passage meets the recitation of the tetrafluoroethylene polymer recited in claim 1. Moreover, by describing the resin with a defined melt flow rate, the patent will lead those of ordinary skill in the art away from the tetrafluoroethylene polymer which, as noted above, does not have melt-moldability. It is noted that in the paragraph bridging columns 10 and 11, Oku discloses that a solid lubricant can be present in the form of particles or flakes. The solid lubricant can be a polytetrafluoroethylene. As such, the solid lubricant is an optional material and the preferred amount would lead those of ordinary skill in the art away from the amount recited in claim 1. The distinct description of this material also emphasizes the differences between the resins described in column 9, which again do not meet the tetrafluoroethylene polymer recited in claim 1. Therefore, the claims now of record are patentable over this document.

Yoshinaka et al., U.S. Patent No. 5,310,598, is also distinct. The patent relates to a radio wave absorbing material comprising zinc oxide whiskers. Resins are described in the passage beginning at column 6, line 31 with thermoplastic resins being described in the paragraph beginning at line 35. Amongst these many resins is included an ethylene/tetrafluoroethylene copolymer and Teflon. However, there is nothing in the patent which would lead those of ordinary skill in the art to the specific fluoro-resin composition defined in the claims of record with the recited amounts of the defined tetrafluoroethylene polymer, zinc oxide whisker and granular filler having a particular configuration and selected from the defined group of materials. Thus, for instance, Example 1 provides a material which includes zinc oxide whiskers and an epoxy resin. Accordingly, absent improper resort to applicants' specification, Yoshinaka et al. does not anticipate and does not lead those of ordinary skill in the art to the invention as defined in the claims of record. In this respect, it has long been established that anticipation is proper only if a single reference describes each

element of the claimed invention without any need for picking, choosing and combining various disclosures not directly related to each other (*see, e.g., In re Arkley*, 172 USPQ 524 (CCPA 1972)).

The claims of record are also patentable over Shimasaki et al., U.S. Patent No. 5,498,654, which provides a sliding bearing material containing at least two of aromatic polyester-resin particles, spherical carbon particles, and zinc-oxide whisker dispersed in a matrix consisting of polytetrafluoroethylene. As may be seen from Table 1 in column 5, the aromatic polyester particles are an indispensable component while the spherical carbon particles and a zinc-oxide whisker are somewhat alternative components consistent with the function of the materials set forth in column 3, lines 23 and 24.

Shimasaki et al. does not disclose the fluoro-resin composition as defined in the claims of record that contains zinc-oxide whisker as an indispensable component and a specific filler different from the aromatic polyester particles and spherical carbon particles. Accordingly, the present invention is not anticipated by Shimasaki et al.

Yamamoto et al., U.S. Patent No. 5,988,891, also cannot be used to anticipate the claims of record. The patent describes a rolling bearing apparatus which comprises a melt-moldable fluoro-resin as the main component and further contains at least one solid lubricant having an average particle diameter of 0.1 to 60 μm and a fibrous filler having an aspect ratio of from 3 to 200. The fibrous filler is disclosed in greater detail in the paragraph beginning at column 6, line 28 with the one of the fibers being zinc oxide whiskers.

As noted above, the tetrafluoroethylene polymer of the present invention does not have melt-moldability. Therefore, by describing a melt-moldable fluoro-resin as the main component, Yamamoto et al. not only does not anticipate the present invention, but would actually lead those of ordinary skill in the art away from the invention.

Sato et al., U.S. Patent No. 6,675,770, provides a pressing device for an apparatus for imparting friction resistance to a rotary shaft driving an engine-output control device. The pressing device is a molded product made of a resinous material having a defined flexural strength and flexural modulus of elasticity. When a friction plate is formed compositely with a plate-shaped member to form the pressing device, the friction plate is formed of a fluorocarbon resin and at least one ingredient selected from a whisker having a Mohs hardness of 5 or less, a carbon fiber and a hard resinous powder. The patent describes that the whisker, the carbon fiber and the resinous powder independently have the same effect in the passages at column 7, lines 8-13 and 14-17. It will also be noted that only one example uses any type of whisker and carbon fiber simultaneously (see Example 11 in column 11) and in that instance, the whisker is calcium sulphate whisker, not zinc oxide whisker. Although the patent mentions Panatetra in the paragraph beginning at column 5, line 44, there is no

recognition that this whisker provides any result different from the other whiskers and there is no example which uses this material. Therefore, Sato et al. also does not describe the specific fluororesin composition defined in the claims of record.

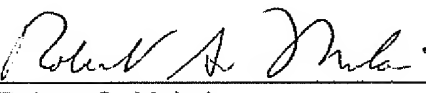
Finally, Yoshinaka et al., U.S. Patent No. 5,183,594, describes a conductive resin composition comprising conductive zinc oxide whisker having a tetrapod structure. However, the patent does not describe or suggest a specific fluororesin composition as defined in amended claim 1. More specifically, the patent describes a resin used as a binder for the composition and exemplifies resins at column 16, lines 14-26. The resin is to be formed into a film as described at column 16, lines 27-62. Therefore, the binder for the conductive resin composition should be dispersed or dissolved in an organic solvent or otherwise should be melted at a temperature in order to form a film. As noted above, the tetrafluoroethylene polymer of the present invention is one that does not have melt- processability and therefore is distinct from the resins set forth in Yoshinaka et al. Moreover, the patent does not recognize the substantial advantages which can be obtained in accordance with the present invention that have been discussed above and illustrated in the specification. Accordingly, Applicants respectfully submit that the claims of record are patentable over Yoshinaka et al.

For all the reasons provided above, Applicants respectfully submit that the amended claims are patentable over the cited prior art and therefore request reconsideration and allowance of the present application.

Should the Examiner have any questions concerning the subject application, the Examiner is invited to contact the undersigned attorney at the number provided below.

Respectfully submitted,

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